FTA Technology 2011
Enterprise Service Bus
August 16, 2011
Agenda

- Modern Architecture for Tax Administration
  - Logical Architecture
  - Agency Blue Print
  - Service Oriented Architecture
- What is a Service Bus & What does it do
- Components and Features
- Service Bus Integration Framework
- Value Proposition (Features and Benefits)
- The Future of ESB Offerings
- Questions
Revenue Agency Blueprint
Service-Oriented Architecture

- Service Orientation
  - Use of “open” interoperability protocols to facilitate service interaction

- Architecture
  - A process of putting together components to achieve some overall goal
  - A blueprint that comprises the components organized by layers, visible properties, relationships and interactions, and constraints

- Definition of Key Terms
  - A repeatable business task
  - A way to integrate your business as linked services
  - An IT Architectural Style
  - A set of related and integrated services
What is a Service Bus

- A flexible connectivity infrastructure for integrating applications and services
- The ESB Empowers your SOA by reducing the number, size, and complexity of managing your interfaces
- SOA without ESB Decouples Interfaces from Applications
- SOA with ESB Decouples Interfaces from point to point connectivity
- Can be thought of as an abstraction layer on top of the Enterprise Messaging System
What Does an ESB Do?

- ESB is used as a multi-functional backbone
- Enables standards-based electronic data integration
- Provides the ability to connect resources
- Expose and mediate the communication among services
- Orchestrate processes
- Manages security and the quality of service
- Enables legacy systems to extend their functionality
- Sets the stage for future data exchange
## Key ESB Components – Support Current and Future Needs

<table>
<thead>
<tr>
<th>Key Component</th>
<th>Feature</th>
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<tbody>
<tr>
<td>EDI Communication</td>
<td>Support popular EDI communication standards such as VAN communication, HTTP, FTP, WebSphere MQ</td>
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<tr>
<td>EDI Message Standards</td>
<td>Support Industry standard message formats such as ANSI ASC X12, HIPAA, VICS, VDA, UCS, etc</td>
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<tr>
<td>Access Manager</td>
<td>Common Application Security components and network security components such as IPS apply consistent security policies for authenticating and authorizing EDI services</td>
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<tr>
<td>Interceptor</td>
<td>Integration Framework comes with extendable interceptors deployed in the ESB that process inbound and outbound EDI messages to provide audit, security functions</td>
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<tr>
<td>Intermediary</td>
<td>Capability to create flows that are capable of acting as a proxy or intermediary with the EDI provider to negotiate communication and transact messages, followed up further routing transformation before delivering it to other solutions or a partner system</td>
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<tr>
<td>Mediation</td>
<td>Leverages the ESB to support protocol, message structure and even security token mediation</td>
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<tr>
<td>Transformation</td>
<td>Leverages the ESB transformation capabilities for transforming legacy and modern data structures</td>
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### Key ESB Components – Support Current and Future Needs

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<td>Route/Distribute</td>
<td>The CGI Integration Framework leverages the ESB messaging functions to provide point-to-point EDI delivery or publish the message to a set of EDI providers</td>
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<tr>
<td>Messaging</td>
<td>Integration Framework is capable of interacting with popular messaging providers such as MQ, JMS and MSMQ.</td>
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<tr>
<td>Partner Profiles</td>
<td>Partner data management, authentication and authorization features allow us to provide services tailored to the SLA established with the partner</td>
</tr>
<tr>
<td>Transaction Management</td>
<td>Integration Framework supports industry standard WS based transaction and is capable of backing out transaction using compensatory means as well. This allows us to transact with modern and legacy applications</td>
</tr>
<tr>
<td>Adapters</td>
<td>Integration Framework leverages ESB features such as adapters and connectors to popular EDI software and partner ERP systems</td>
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<tr>
<td>Registry</td>
<td>Repository of service definitions and service metadata. Used by EDI services to interact with partner systems</td>
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Service Bus Integration Framework

- Eclipse plug-in, is used by the developer to create, maintain and deploy the Integration components
- Development team to focus on solving the business problem
- Allows the developer to implement only the business logic
- Service end points are native to leading middleware containers such as ESB’s and Application servers
- Multi-functional backbone in service oriented architecture (SOA) to enable standards-based electronic data integration
- Ability to connect resources, expose and mediate the communication among services, orchestrate processes, manage security and the quality of service
Value Proposition (Features and Benefits) When does it make sense$

- When Organizations adopt a more holistic approach to SOA infrastructure
- Evaluate the cost and risks of complex infrastructure like a full fledged SOA Backplane
- Effort Pays off when investment is spread across multiple or large phased projects like ITS implementations
- Deploy SOA Backplane and Governance structures by “think global” act “local” approach
- Deploy an initial basic foundation comprising the ESB Core and some adapters
## ESB Features and Benefits

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<th>ESB Features – Today and Future</th>
<th>Benefits to State</th>
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| **Specification based support for reliable and guaranteed delivery** | Reliable Message exchanges between applications and partner system using specifications such as WS-Reliability  
The Messaging subsystem supports guaranteed delivery of messages with retry functionality |
| **Central Security, Audit & Monitoring** | Support for WS*-based security shared by the application layer  
Configuration-based audit support for Integration layer to capture content at access, mediation, and transformation layers. Information shared with common audit sub system to provide an enterprise wide view  
Integration layer monitoring tied to the central monitoring stack to provide a enterprise wide view of the application health |
| **Supports an “integration highway” between systems/platforms such as legacy, mainframe, standard COTS external partners** | Supports efficient integration during iterative implementation initiatives and beyond  
Lowers operational costs. Reduces risk |
| **Enforces a “quality of service” and consistency as data moves internally within COTS and externally throughout the enterprise** | Enables metrics-based approach for monitoring and continuous improvement  
Decreases cost  
Increases performance |
| **Supports COTS enterprise IT Governance and essential controls** | Supports strategic data integration patterns identified by the State Wide Data Strategy |
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<td>Supports EAI with EDI, and other industry standard-based communication protocols through the ESB included in the SOA platform</td>
<td>Lowers cost&lt;br&gt;Decreases risk&lt;br&gt;Proven platform</td>
</tr>
<tr>
<td>Allows creation and deployment of EDI quickly and easily between applications and services</td>
<td>Supports common EDI formats out of the box&lt;br&gt;Enables continued, uninterrupted EDI-based business interactions&lt;br&gt;Leverages existing State assets</td>
</tr>
<tr>
<td>Enables efficient legacy integration during phased implementation and reduced number and complexity of interfaces over time</td>
<td>Supports iterative implementation&lt;br&gt;Lowers operational cost</td>
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<tr>
<td>Provides a common, application independent backbone for internal and external service integration and interaction</td>
<td>Leverages existing services, development and configuration knowledge&lt;br&gt;Increased scalability and interoperability</td>
</tr>
<tr>
<td>Supports various Industry standard protocols new and legacy with option to add new protocol adapters as the specifications are standardized</td>
<td>Supports integration of new and legacy applications&lt;br&gt;Supports phased modernization&lt;br&gt;Mediation between applications that do not share the exchange protocol&lt;br&gt;Support for future protocols and data formats</td>
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<td>Scalable and Highly Available ESB</td>
<td>Native support for clustered deployment&lt;br&gt;Highly available integration services&lt;br&gt;Scalability through easy addition of resources</td>
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The Future of ESB Offerings

- SOA Suites and SOA Platforms
- Packages Management Tools and Products
- iPaaS Integration Platform as a Service
- Single Vendor Products Integrated Suites
- Multiple ESB Vendors some open source

The Enterprise Service Bus Drives the Data Exchange Train
TIBCO DOR SOA Framework

Operational Intelligence Apps

- TIBCO Business Works
  - Smart Data Mapping
  - Hawk

- TIBCO Active Matrix BPM
  - Long lived processes
  - Human Processes
  - Goal-oriented process management

- TIBCO CIM
  - Vendors, Tax Payers, Employees, Locations
  - Ensures Interactions are consistent

- TIBCO MFT
  - Internal\External Transfers across open platforms
  - Scalable
  - Encrypted and Secure

Actionable Event Cloud in Memory

- Business Events
  - “Event Server”
- Metrics
  - “In memory Structured search”
- “Low latency, short lifecycle transactional apps”

Active Spaces
- “Data Grid”

Enterprise Service Bus

- New Tax System
- NCOA
- XML/EDI
- IVR
- Imaging
- Outside Agencies

All DOR Tax applications

DOR Apps
Vendor Example TIBCO SOA Overview
ESB Monitoring Example
CGI Experience helping Government collect additional delinquent revenues

- Integrated Tax Systems
  - Implemented numerous successful tax processing systems and data warehouses for tax agencies

- Collection Enhancements
  - Automated collection tools
  - Taxes, court fines, child support, student loans, motor vehicles
  - Business process improvements
  - Statistical Models

- CGI has a proven process, and is willing to be paid only out of increase in revenues

Grand Total
Over $1.7 Billion

- California
  - $570 Million
  - $176 Million
  - $41 Million
  - $37 Million

- Kansas
  - $182 Million

- New York City
  - Internal Revenue Service

- Virginia
  - $231 Million

- North Carolina
  - $37 Million

- Missouri
  - $55 Million

- Hawaii
  - $252 Million
  - $117 Million

Canada Revenue Agency

Australian Tax Office
Questions/Discussion
ISO 9001 Certified

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About the Presenter

- CIO Kansas DOR 11 Years
- FTA/IRS State Co-Chair TAG 2005-2007
- FTA/IRS State Co-Chair TAG Security Committee 2006-2008
- MTC Technology Committee Chair 2000-2008
- FTA National Service and Leadership Award in State Tax Administration 2008
- Experience with Local, State, Federal, and International tax agencies
- 32 Years in Information Technology Development, Management, and Leadership in State Government